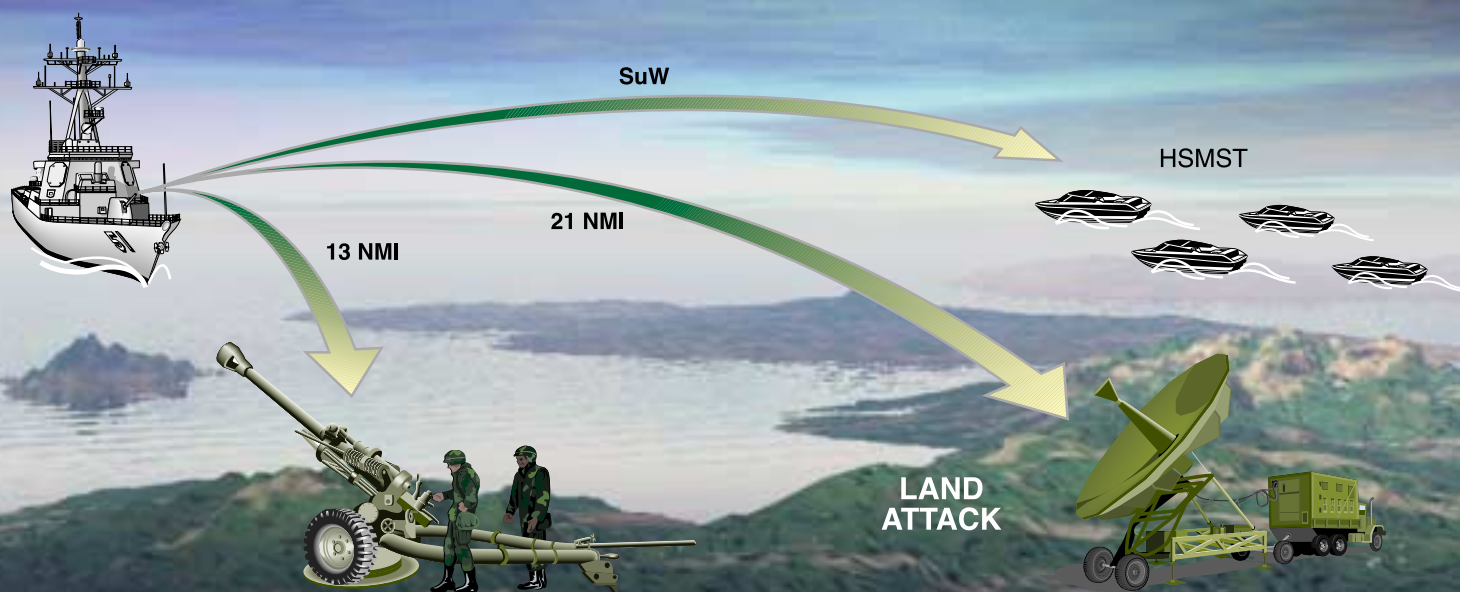


NAVAL SEA SYSTEMS COMMAND



5-INCH Cargo Projectile

MK 172, HE-ICM



NAVAL SURFACE WARFARE CENTER, DAHLGREN DIVISION

DAHLGREN PANAMA CITY DAM NECK



Introduction

The U.S. Navy Conventional Ammunition Program Office (PM4) is in the process of qualifying a new 5-Inch Cargo Projectile that provides increased lethality and volume of fire capability in both Naval Surface Fire Support (NSFS) and Surface Warfare (SuW) missions. Threshold range requirements have been met and plans are in place to meet an objective range of 21 nmi when fired from the 5-Inch, MK 45 MOD 4 Gun Mount. The 5-Inch Cargo Projectile:

- Meets the U.S. Marine Corps requirement for “inexpensive, volume fire munitions” during the “critical early stages of ship-to-objective maneuvers when organic artillery is afloat”
- Meets the U.S. Marine Corps predicted fire accuracy requirements
- Operates in 5-inch, 54-caliber and upgraded 5-inch, 62-caliber gun environments

Land Attack

In Land Attack missions, the MK 172 will be gun-fired the same as all other conventional 5-inch ammunition. The fuze is set to expel the MK 2 submunitions at the optimum range and height of burst to enable the grenades to cover the target area in a circular pattern. Overlapping patterns from multiple rounds provide a heavy concentration of grenades in the target area.

Surface Warfare (SuW)

In SuW missions, the grenade pattern is a near-optimum, elongated ellipse along the gun-target line. It is predicted that coverage from multiple rounds will be large enough so that there will be little chance of a maneuvering surface attacker avoiding multiple hits. Consequently, the probability of kill against surface attackers will be significantly greater than for other conventional rounds. Concept of employment and other tactics-related studies are ongoing to integrate the MK 172 Projectile into the layered defense strategy for specific ships.

Program Plan and Schedule

The Baseline Phase has been successfully completed, and the Extended Range Phase is in process. Both are described below:

- **Baseline.** The 5-Inch Cargo Baseline configuration (projectile body assembly without fuze) received Provisional Approval for Production (PAFP) from the Weapon System Explosives Safety Review Board (WSESRB) on 25 March 1998. Production is in process. The Baseline configuration will provide the Fleet with the capability to support NSFS and SuW missions against a wide range of targets at ranges up to 13 nmi.

- **Extended Range.** The 5-Inch Cargo Extended Range Configuration will provide the Fleet with the capability to support NSFS missions against a wide range of targets at ranges up to 21 nmi. (Capability against High Speed Maneuvering Surface Targets at close-in ranges is retained.) The 5-Inch Cargo Extended Range Phase will:
 - Qualify the Extended Range EX 175 Propelling Charge for the 21-nmi range in the 5-Inch, 62 Caliber, MK 45 MOD 4 Gun
 - Qualify the EX 432 Electronic Time (ET) Fuze
 - Conduct system integration testing with the MK 160 Fire Control System
 - Conduct shipboard testing with the 5-Inch, 62-Caliber, MK 45 MOD 4 Gun aboard DDG-81 Class ships.

System Description

The MK 172, HE-ICM Projectile:

- Uses a HIFRAG (low drag) shape to achieve increased range
- Uses an Electronic Time (ET) Fuze
- Houses a load containing 49 MK 2 dual-purpose (fragments and shaped-charge) submunitions. The MK 2 Submunition is the U.S. Army Type Classified M80 Grenade, modified to replace the main charge and lead with the U.S. Navy-qualified PBXW-11/PBXN-5 Insensitive Munitions.
- Has a universal cylindrical interior cavity to accommodate a wide variety of future loads (i.e., HE, obscurants, ILLUM, IR/RF decoy, etc.)



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